



# SUSTAINABLE CURRICULUM REPORT

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BY THE OFFICE OF SUSTAINABILITY

CONCORDIA

## TABLE OF CONTENTS

INTRODUCTION .....	2
METHODOLOGY .....	2
SUSTAINABLE COURSE INVENTORY .....	4
CONTINUING EDUCATION.....	6
LEARNING OUTCOMES .....	7
RECOMMENDATIONS .....	8
APPENDIX A.....	9
APPENDIX B.....	12
APPENDIX C.....	13

## INTRODUCTION

In March 2020, the Office of Sustainability conducted a study to assess the extent to which sustainability has been incorporated into the recent (2018-2019 to 2019-2020) and upcoming (2020-2021) curriculum offered at Concordia University. The guidelines for establishing the sustainable course inventory were structured around the Association for the Advancement of Sustainability in Higher Education (AASHE)'s Sustainability, Tracking, Assessment and Rating System (STARS) version 2.2 criteria. The following report is designed to evaluate sustainable course offerings at Concordia in terms of sustainability content as well as accessibility. This report will provide prospective and current students and faculty members with a list of courses with sustainability content. Moreover, the report will equip the university with recommendations on how to improve the integration of sustainability into its curriculum. Offering students sustainability courses is critical to developing their knowledge of sustainability concepts and issues which can be applied in their daily and professional life. Offering these courses across various departments increases accessibility and the comprehensiveness of sustainability education.

## METHODOLOGY

A series of keyword searches were employed to identify courses with sustainability content, to differentiate these as “sustainability-focused” or “sustainability inclusive” and to assign one or more United Nations Sustainable Development Goals (SDGs) to the resulting course list. No courses were taken out prior to the word search and courses with multiple offerings or sections were counted as one course.

The first keyword list contained 255 independent entries and was obtained from STARS 2.2 support document list. These keywords were originally derived from the UN Sustainable Development Goals (SDGs) as well as the Earth Charter and compiled into a single list. The keyword search was applied to all courses on the Student Information System (SIS) course list after it was filtered to display courses that had been offered at least once between 2018-2021. Courses were then manually reviewed to ensure that they included actual sustainability content. It is important to note that the 2020-2021 course offerings remain relatively unchanged despite the new online teaching method due to COVID-19 safety regulations.

A second keyword analysis was used to identify the extent to which sustainability was included in each course. Courses were considered to be either sustainability-focused or sustainability-inclusive based on STARS 2.2 guidelines. The following definitions were used to differentiate courses by sustainability type:

*Sustainability-Focused:* the primary and explicit focus of the course is on the interdependence of ecological and social/economic systems or a major sustainability challenge.

*Sustainability-Inclusive:* the course description or rationale provided in the course inventory must indicate that the course incorporates a unit or module on sustainability or a sustainability challenge, includes one or more sustainability-focused activities, or integrates sustainability challenges, issues, and concepts throughout the course.

For the second keyword analysis, the list was narrowed down to 41 keywords. These were selected in support of the sustainability-focused category defined above, because they inherently imply both social, economic and environmental elements. These words are in bold in Appendix A and include words such as ecosystem\*, resilienc\*, food insecurity and traditional knowledge.

Finally, each keyword was labelled with one or more of the UN SDGs using keywords found specifically in the SDG description online. Courses were assigned SDGs relevant to the course content based on the description and title provided from the SIS data obtained through the Concordia Open Data Portal. The table in Appendix A indicates each SDG and their associated keywords.

Following the keyword searches, courses were organized into a comprehensive inventory featuring the course code, department, course title, course description and SDGs associated to each course. If courses were listed in multiple departments or academic divisions, they were counted twice in the inventory. For example, a sustainability-inclusive anthropology course ANTH 462 was also listed as a sociology course SOCI 462.

## SUSTAINABLE COURSE INVENTORY

Courses were designated as sustainability-focused or sustainability-inclusive (Table 1; see methodology for more information). The number of departments with sustainable course offerings is also indicated. The table in Appendix B indicates the number of courses with sustainability content per department. Ten departments at Concordia do not offer sustainability content such as the departments of Health, Kinesiology and Applied Physiology, Études Françaises and Accountancy. The departments that offer the most sustainability courses are the Geography, Planning & Environment department (66) and the Sociology and Anthropology department (61).

Table 1 – Sustainability course content by type of course and number of departments

Courses	Total
Sustainability-Focused	137
Sustainability-Inclusive	389
<b>Total Sustainability Courses</b>	<b>526</b>
All Courses (2018-21)	4,480

Departments	Total
<b>Departments with Sustainability Courses</b>	<b>42</b>
All Academic Departments	52

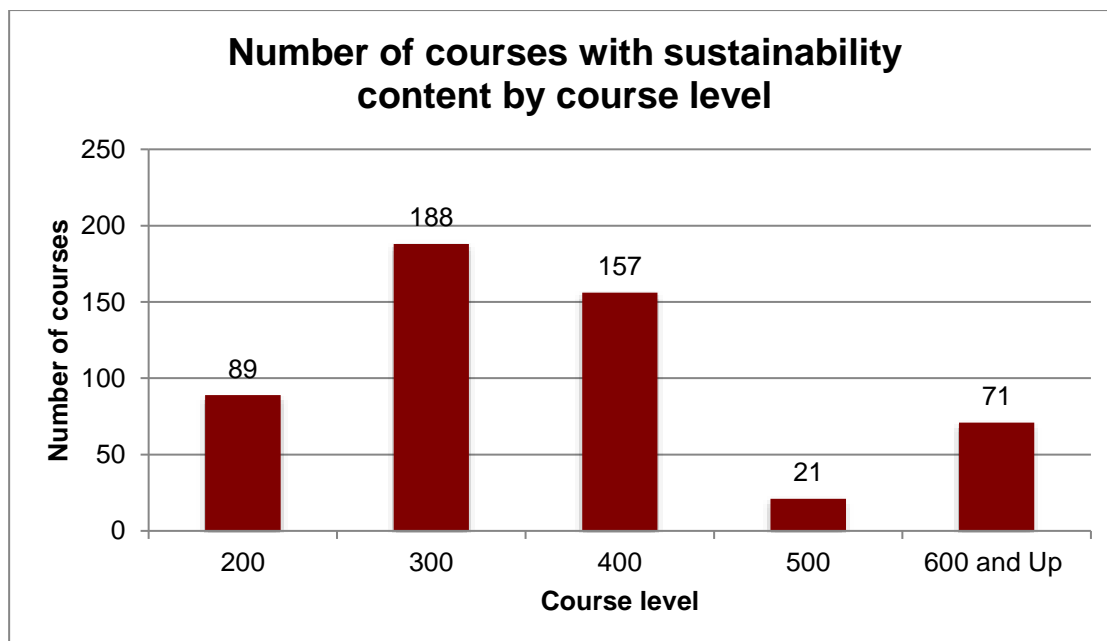


Figure 1 – Sustainable course offerings organized by course level

The previous sustainable course inventory was part of the sustainable curriculum project Concordia developed with the Sustainability Action Fund. The report covered three academic years (2012-2015) and was structured around the previous STARS 2.0 criteria. Based on the figures submitted to STARS in 2017, the percentage of courses containing sustainability content has increased from 8.3% to 10.9%. The number of departments offering sustainability course content has also increased from 77.1% to 80.8%. These findings indicate an upward trend in the number of courses and accessibility of sustainability in curriculum.

In relation to comparative universities, Concordia's percentage of courses containing sustainability content is below the average of 15.6%. Comparative universities were chosen based on *Maclean's*<sup>1</sup> categorization of universities that considers the differences in levels of research funding, the diversity of offerings, and the breadth and depth of graduate and professional programs.

As previously stated, STARS 2.2 criteria define sustainability-focused courses as having a primary focus on major sustainability challenges. Examples of sustainability challenges include global poverty and inequality, environmental degradation and climate change. Sustainability challenges are fundamental to the targets set by the UN's seventeen Sustainable Development Goals. The sustainable course inventory included an analysis of the prevalence of SDGs within the 137 identified sustainability-focused courses at Concordia University. As demonstrated in Figure 2, it was found that *SDG 11: Sustainable Cities and Communities* (71%) and *SDG 1: No Poverty* (64%) were most prevalent in sustainability courses at Concordia. Conversely, *SDG 8: Decent Work and Economic Growth* (33%), *SDG 13: Climate Action* (34%) and *SDG 7: Affordable and Clean Energy* (34%) were least prevalent.

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<sup>1</sup> "Canada's best Comprehensive universities: Rankings 2022," *Maclean's*, October 7, 2021, <https://www.macleans.ca/education/canadas-best-comprehensive-universities-rankings-2022/>

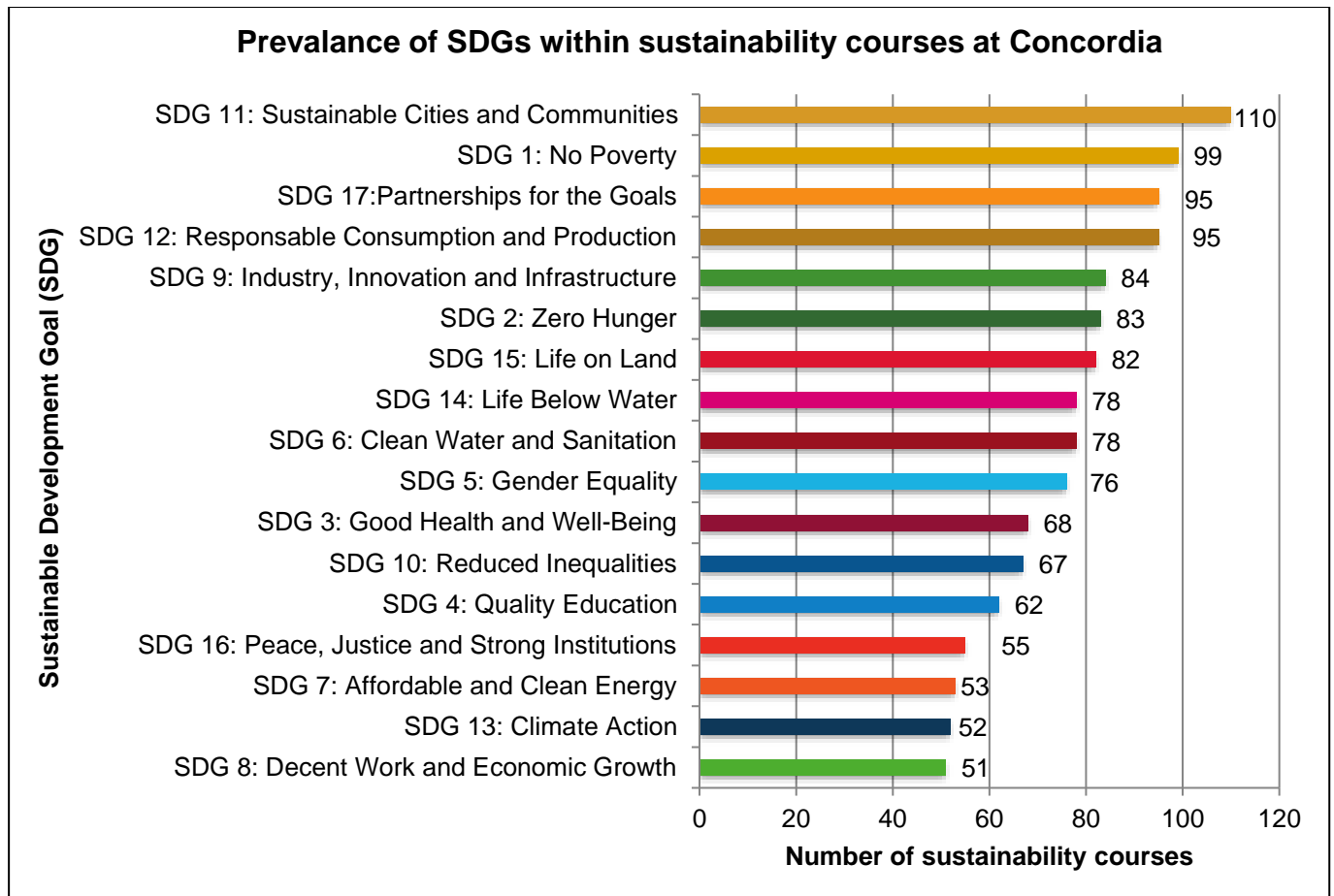


Figure 2 – Prevalence of SDGs within sustainability courses at Concordia

## CONTINUING EDUCATION

Continuing Education courses were evaluated using the same criteria for sustainability and utilizing the same keywords as the undergraduate and graduate curriculum assessment (Table 2). Only 2.2% of Continuing Education courses include sustainability-content. The percentage of Continuing Education courses that include sustainability-content has decreased from 7.7% submitted in the last STARS report.

Table 2 – Sustainability content in Continuing Education courses

Courses	Total
Sustainability-Focused	3
Sustainability-Inclusive	2
<b>Total Sustainability Courses</b>	<b>5</b>
All Courses (2018-21)	229

## LEARNING OUTCOMES

Learning outcomes were assessed for all academic departments identified in the sustainable course inventory. There is no singular location or database for learning outcomes associated at the program or departmental level at Concordia University. Learning outcomes were obtained by first cross-referencing programs in the sustainable course inventory, and then manually searching corresponding program web pages. Programs with learning outcomes that include sustainability keywords were included. Programs with core courses identified as sustainability-focused in the sustainable curriculum inventory were also included.

The result is that 33 programs at Concordia University currently adopt learning objectives that include sustainability (see Appendix C for full list). The number of students graduating from these programs in the 2019-2020 academic year was used to calculate the percentage of graduates from degree programs that require an understanding of the concept of sustainability. Approximately 19.1% of Concordia graduates in 2019-20 graduated from degree programs that require an understanding of the concept of sustainability. This is an increase from the 8.5% that was calculated for the last STARS report. Concordia's percentage of graduates is slightly below the 21.1% average of its comparative universities.

*Table 3 – Number of graduates with sustainability learning outcomes*

<b>2019-20 Academic Year</b>	<b>Number of graduates</b>
<b>Total number of graduates from degree programs that require an understanding of the concept of sustainability</b>	<b>1,531</b>
Total number of graduates from degree programs	8,024



## RECOMMENDATIONS

The following are recommendations based on the analysis conducted for the sustainable curriculum report:

- A system for developing and cataloguing learning outcomes at the course and program levels would facilitate this assessment as well as increase the program transparency and comparability.
- Sustainability-focused and sustainability-inclusive courses could be offered at the 200 or introductory level to ensure that students who are not enrolled in programs with pre-established sustainability learning outcomes can still have access to sustainability content through elective course options.
- Support to develop their curriculum could be provided to departments who currently have no or few sustainability courses.
- The quality of sustainability course offerings should be analyzed in the future, potentially through the targeted use of a sustainability literacy assessment or other tools.
- The Sustainable Development Goals with the lowest representation in the sustainable course inventory were *SDG 8: Decent Work and Economic Growth* (33%), *SDG 13: Climate Action* (34%) and *SDG 7: Affordable and Clean Energy* (34%). Support could be given to faculty members to develop courses that include these SDGs.
- An alternative method to keyword searches for conducting a sustainable course inventory could be the self-assessment of courses by faculty members. A similar project has been piloted for faculty members to self-identify their courses as experiential learning courses.

## APPENDIX A

Table - Keywords by SDG. Ke<sup>2</sup>ywords were used to designate sustainability-inclusive (all keywords) and sustainability-focused (bolded keywords) courses.

	<p>Basic needs, basic rights, cooperation, developing countries, distribution of wealth, enabling technology, <b>environment</b><sup>*</sup>, equal access, equal, equalit<sup>*</sup>, equit<sup>*</sup>, extreme event<sup>*</sup>, extreme weather, land consumption, least developed countries, micro-enterprise, microfinance, natural, resources, poverty, protect<sup>*</sup>, <b>resilienc</b><sup>*</sup>, resource<sup>*</sup>, socio-economic, social, <b>*sustainab</b><sup>*</sup>, tenure rights, the poor, undernourishment, vulnerable</p>
	<p>Cooperation, cruelty to animals, developing, countries, earth, ecolog<sup>*</sup>, <b>ecosystem</b><sup>*</sup>, enabling technology, equal access, equal, equalit<sup>*</sup>, equit<sup>*</sup>, extreme event<sup>*</sup>, extreme weather, family planning, first nations, first peoples, flood<sup>*</sup>, <b>food insecurity</b>, food, genetic, hunger, <b>indigenous peoples</b>, land consumption, least developed countries, malnutrition, resource<sup>*</sup>, rural infrastructure, safe<sup>*</sup>, small-scale<sup>*</sup>, soil, strengthen families, sufficient food, <b>*sustainab</b><sup>*</sup>, tenure rights, the poor, <b>traditional knowledge</b>, undernourishment, vulnerable, wisdom</p>
	<p>Affordab<sup>*</sup>, AIDS, bodily health, communicable diseases, <sup>*</sup>contaminat<sup>*</sup>, developing countries, dignity, disability<sup>*</sup>, family planning, hazardous chemicals, hazardous substances, hazardous <b>waste</b>, health worker, hepatitis B, HIV, human health, least developed countries, malaria, maternal mortality, mortality rate, occupational injur<sup>*</sup>, pollution, potable, protect<sup>*</sup>, public, quality of life, reproductive, reverence for life, rising sea level<sup>*</sup>, road traffic, safe<sup>*</sup>, small island developing state, SIDS, soil, strengthen, families, substance abuse, suicide, <b>*sustainab</b><sup>*</sup>, tobacco use, tropical disease, tuberculosis, undernourishment, universal access, universal health coverage, <b>water</b><sup>*</sup>, well-being</p>
	<p>Affordab<sup>*</sup>, basic rights, cooperation, cultural diversity, developing countries, disparit<sup>*</sup>, diversity, enabling technology, equal access, equal, equalit<sup>*</sup>, equit<sup>*</sup>, first nations, first peoples, human rights, <b>indigenous peoples</b>, least developed countries, literacy, peace<sup>*</sup>, quality of life, safe<sup>*</sup>, small island developing state, SIDS, <b>*sustainab</b><sup>*</sup>, unemployment, <sup>*</sup>violen<sup>*</sup>, vulnerable, wisdom, youth employment</p>
	<p><sup>*</sup>Discriminat<sup>*</sup>, empower<sup>*</sup>, enabling technology, equal, equalit<sup>*</sup>, equit<sup>*</sup>, family planning, forced marriage, gender, genital mutilation, maternal mortality, <b>natural resources</b>, protect<sup>*</sup>, public, reproductive, resource<sup>*</sup>, responsib<sup>*</sup>, shared responsibility, socio-economic, social, strengthen families, <b>*sustainab</b><sup>*</sup>, tenure rights, trafficking, universal access, unpaid work, <sup>*</sup>violen<sup>*</sup>, voting rights</p>
	<p><b>Access to water</b>, cooperation, <b>drinking water</b>, earth, ecolog<sup>*</sup>, <b>ecosystem</b><sup>*</sup>, equit<sup>*</sup>, freshwater, hazardous chemicals, hazardous substances, hazardous waste, local<sup>*</sup>, participatory, pollution, potable, protect<sup>*</sup>, <b>recycl</b><sup>*</sup>, resource<sup>*</sup>, <b>reuse</b>, safe<sup>*</sup>, strengthen, local communities, suffering, <b>*sustainab</b><sup>*</sup>, universal access, <b>untreated wastewater</b>, vulnerable, <b>water</b><sup>*</sup></p>

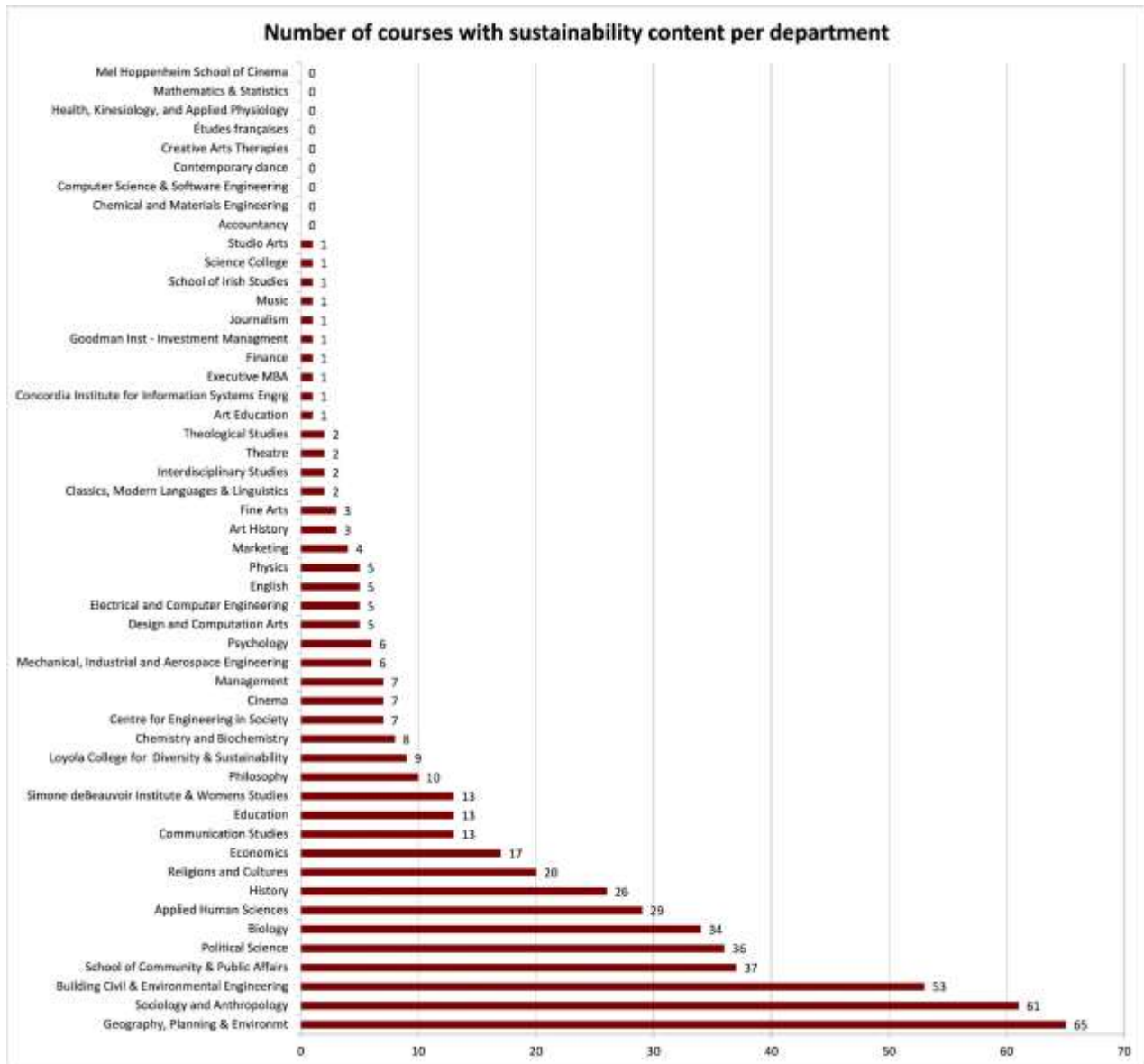
<sup>2</sup> Words with an asterisk are truncated to ensure inclusion of the word in all its forms (ex: sustainability, sustainable)

	<p><b>Clean energy, clean fuels</b>, cooperation, developing countries, enabling, technology, <b>fossil fuel</b>, least developed countries, radioactive, <b>*renewable*</b>, small island developing state, SIDS, solar, <b>*sustainab*</b>, universal access, wind</p>
	<p>Child labour, decent work, developing countries, effective institutions, equal, equalit*, equit*, forced labour, labour, least developed countries, livelihood, local*, occupational injur*, protect*, safe*, slavery, small and medium sized enterprises, SME, socio-economic, <b>*sustainab*</b>, trafficking, unemployment, unpaid work, youth employment</p>
	<p>Affordab*, developing countries, enabling technology, <b>environment*</b>, equit*, least developed countries, public, small island developing state, SIDS, small-scale*, socio-economic, <b>*sustainab*</b>, universal access</p>
	<p>Accountable institutions, culture of tolerance, democra*, developing countries, <b>*discriminat*</b>, effective institutions, empower*, inequality*, least developed countries, legitimate institution, migrant*, migrat*, minorit*, population growth, protect*, quality of life, representat*, responsib*, safe*, small island developing state, SIDS, socio-economic, social, <b>*sustainab*</b>, voting rights</p>
	<p>Adequate housing, affordab* , <b>air quality</b>, basic needs, <b>clean air</b>, collaborative, common good, cultural heritage, cultural, significance, developing countries, direct participation, disaster, emergency, <b>environment*</b>, equal, equalit*, finite world, future, generations, green, harassment, human communities, humane, inclusive, informal settlements, least developed countries, material sufficiency, meaningful participation, natural heritage, participatory, particulate matter, protect*, public , <b>residual waste</b>, <b>resilienc*</b>, road traffic, safe*, slum, socio-economic, social, <b>solid waste</b>, <b>*sustainab*</b>, the poor, toxic, transparen*, transport, universal access, <b>urban sprawl</b>, <b>urbanization</b>, vulnerable, <b>waste</b></p>
	<p><b>Environment*</b>, equit*, finite world, <b>fossil fuel</b>, <b>harmony with nature</b>, local*, material consumption, <b>natural resources</b>, protect*, public, <b>residual waste</b>, resource*, respect for nature, <b>reuse</b>, soil, <b>solid waste</b>, <b>*sustainab*</b>, the poor, toxic waste</p>
	<p><b>Climate adaptation</b>, <b>climate change</b>, <b>climate-related</b>, emission*, <b>footprint</b>, green, <b>greenhouse gas*</b>, <b>GHG</b>, local*, <b>resilienc*</b>, small island developing state, SIDS, <b>*sustainab*</b></p>
	<p>Coastal eutrophication, <b>conserv*</b>, cooperation, depletion of resources, desalination, developing countries, earth, ecolog*, <b>ecosystem*</b>, enabling technology, fish , fisheries, <b>illegal fishing</b>, least developed countries, loss of species, marine, native species, ocean acidification, overfishing, pollution, <b>precautionary approach</b>, <b>preservation</b>, protect*, regenerat*, <b>resilienc*</b>, resource*, reverence for life, small island developing state, SIDS, small-scale*, <b>*sustainab*</b>, <b>unregulated fishing</b>, <b>water*</b></p>

	<p>Afforestation, alien species, <b>biodiversity</b>, biosphere, <b>conserv*</b>, deforestation, degradation, depletion of resources, desertification, earth, ecolog*, <b>ecosystem*</b>, endangered, species, equit*, extinction, flood*, forest, freshwater, genetic , invasive species, livelihood, living being*, local*, loss of species, native species, <b>poach*</b>, poverty, <b>precautionary approach</b>, <b>preservation</b>, priority species, protect*, reforest*, regenerat*, resource*, reverence for life, soil, *<b>sustainab*</b>, <b>threatened species</b>, trafficking, <b>water*</b>, wildlife</p>
	<p>Active participation, bribery, corruption, demilitarize, *discriminat*, economic justice, effective, governance, effective institutions, equal access, ethical, freedom, fundamental freedoms, illicit arms, illicit financial, injustice, intentional, homicide, justice for all, meaningful, participation, minorit*, organized crime, peace*, protect*, public , representat*, rule of law, solidarity, struggle, *<b>sustainab*</b>, torture, trafficking, sentenced detainee, *violen*, weapons of mass destruction</p>
	<p>Affordab*, capacity-building, civil society, cooperation, debt relief, debt restructuring, developing countries, distribution of wealth, enabling technology, <b>environment*</b>, equit*, exploitation, <b>globalization</b>, least developed countries, migrant*, migrat*, minorit*, multi-stakeholder, mutual understanding, open exchange, poverty, public, small island developing state, SIDS, *<b>sustainab*</b>, the poor, wisdom, zero-tariff</p>

## APPENDIX B

Table – Number of courses with sustainability content per department at Concordia University



## APPENDIX C

*A list of degree programs that require an understanding of the concept of sustainability*

1. GrDip Biotechnology and Genomics
2. Minor Diversity and the Contemporary World
3. BSc Ecology
4. Menv Environmental Assessment
5. DEA / GrDip Environmental Assessment
6. BSc Environmental Geography
7. BSc Environmental Science
8. BA / Minor First People's Studies
9. MSc Geography, Urban & Environmental Studies
10. PhD Geography, Urban & Environmental Studies
11. Minor / Cert Geospatial Technologies
12. BA / Minor Human Environment
13. Minor / Cert Immigration Studies
14. PhD Social and Cultural Analysis
15. MASocial and Cultural Anthropology
16. Minor Sustainability Studies
17. BA / Minor Urban Planning and Urban Studies
18. BA / Minor Women's Studies
19. BEng Aerospace Engineering
20. BEng Building Engineering
21. BEng Civil Engineering
22. BEng Computer Engineering
23. BEng Electrical Engineering
24. BEng Industrial Engineering
25. BEng Mechanical Engineering
26. BEng Software Engineering
27. Meng Master of Environmental Engineering
28. Grad.Cert. Certificate in Environmental Engineering
29. MSc Civil Engineering
30. MEng Civil Engineering
31. MEng Construction Engineering and Management
31. BFA Major in Design
32. MDes Master of Design
33. BFA Fibres and Material Practices